

## MEMORANDUM

December 21, 2007

To: Kevin Rochlin, EPA - Remedial Project Manager  
From: John Roland, Department of Ecology - Project Coordinator  
Subject: Upper Columbia River – Comments on the Draft Phase 1 Sediment Toxicity Studies Summary Memorandum, August 2007

Based on a review of the August 2007 Upper Columbia River sediments toxicity summary memorandum, Ecology seeks EPA consideration on the following comments.

### General:

We ask that the document to be finalized contain clear qualifiers explaining, effectively, that this is simply a brief presentation of the initial toxicity results. The memo can be designed to support an expected full presentation and interpretation of results under the Phase 2 remedial investigation phase to be performed by Teck Cominco. A complete evaluation and presentation of the results should be an actual task called out in the RI/FS Work Plan. This further assessment should occur prior to the use of these data in the risk assessment process, or prior to proposing additional toxicity work.

Further, as the draft August memo is not a comprehensive examination and presentation of outcomes, there also needs to be clear expectations presented for the work to still be completed that will inform the Phase 2 RI and planning. These expectations should be presented in a far more robust recommendations section in the memo. The memo also can make appropriate reference to the core data interpretation needs on this topic as previously submitted to EPA by the Participating Parties. The Phase 1 toxicity results carry great value, have been a significant investment, show risk, and play a key role in informing EPA on the nature of risk in the system.

### Specifics:

#### Section 4.2 – First paragraph

*“Organism responses to test sediment exposures were compared to the responses observed in the laboratory negative controls and reference area sediments. The statistical analyses performed by the laboratories followed those outlined by ASTM and USEPA.”*

What were the statistical analyses performed by the laboratories that compared the test sediment exposures to laboratory negative controls and reference areas? The only results of statistical analyses that are presented in the Memorandum are percent of average reference growth for *Hyalella azteca* and *Chironomus tentans*, percent of average reference mortality for *Ceriodaphnia dubia*, and percent of average reference reproduction for *Ceriodaphnia dubia*.

A statistical evaluation of the test sediments to laboratory negative controls was not presented. Please provide all relevant information and modify the statement to state what statistical analyses were performed in addition to evaluating and presenting the laboratory negative control data.

### Section 6.3 – First paragraph

*“Factors that represent potentially confounding factors when interpreting bioassay results were evaluated during the investigations. These factors include sulfide (measured as AVS), ammonia, and grain size. No correlation was observed between the effects measured during the bioassays and any of these potentially confounding factors.”*

How was it determined that there was not a correlation between the effects measured during the bioassays and potential confounding factors? Only sulfide data, as AVS/SEM, is presented (Figure 6-10) to support this statement. The statement should be limited to a discussion of sulfide only, or additional analyses and data should be presented that include ammonia and grain size influences (or lack of) within the discussion.

### Section 8.0

Additional recommendations related to data gaps should be added within EPA's responses to comments provided during previous reviews of the Memorandum. Additional recommendations to consider include:

- The need to evaluate the Phase I bioassay data and any related data from future toxicity studies beyond what is currently presented in the Memorandum. Specifically, the following additional analyses are suggested:
  - The inclusion of biomass as an endpoint.
  - Use of a reference envelope.
  - A valid statistical evaluation of the data.
- Physical (e.g. grain size) and chemical (e.g. ammonia, TOC, sulfide) aspects of the test and reference sediments should be thoroughly evaluated in relation to the toxicity results.
- The need for additional test methods and organisms beyond the three conducted. Recommendations of additional acute/chronic sediment toxicity test organisms are: freshwater mussels, an oligochaete (for bioaccumulation testing), and white-sturgeon.

### Figures 6-1 and 6-3

The line representing the test acceptability criteria for amphipod and *Ceriodaphnia dubia* mortality should be eliminated. Determining test acceptability is related to laboratory controls and their % survivorship in the case of the two discussed figures. The minimum mean survival (80%) for laboratory controls is not used in the statistical analysis to determine whether tested sediment is labeled as a hit/no hit but rather to determine if the control will be accepted. The inclusion of the test acceptability criteria for control survival (labeled as 20% mortality within the figures) gives a false pretense that test samples that are above this line have a level of toxicity that is significant when compared to laboratory controls or reference sediments.

Thank you for the opportunity to comment. Please call if you wish to discuss any aspects.